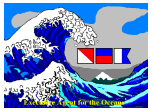
Synthetic Environment Data Representation & Interchange Specification (SEDRIS)

Presented by:

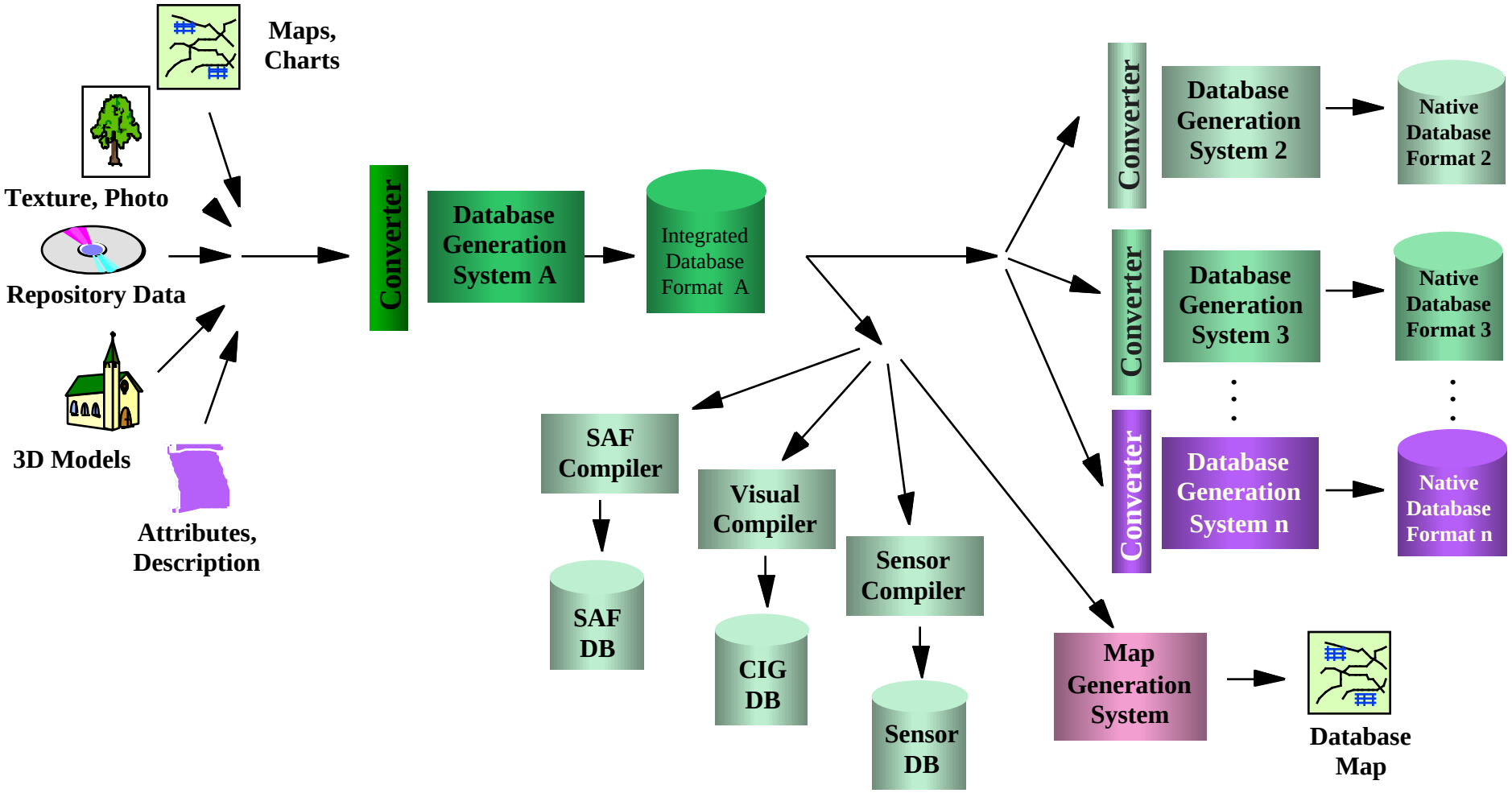
The SEDRIS Team



Agenda

- **Database Generation Process**
- **SEDRIS Role**
  - **Motivation**
  - **Objectives**
  - **Benefits**
- **Development Process**
- **Demonstration of Capability**

How M&S Databases Are Generated and Shared Today



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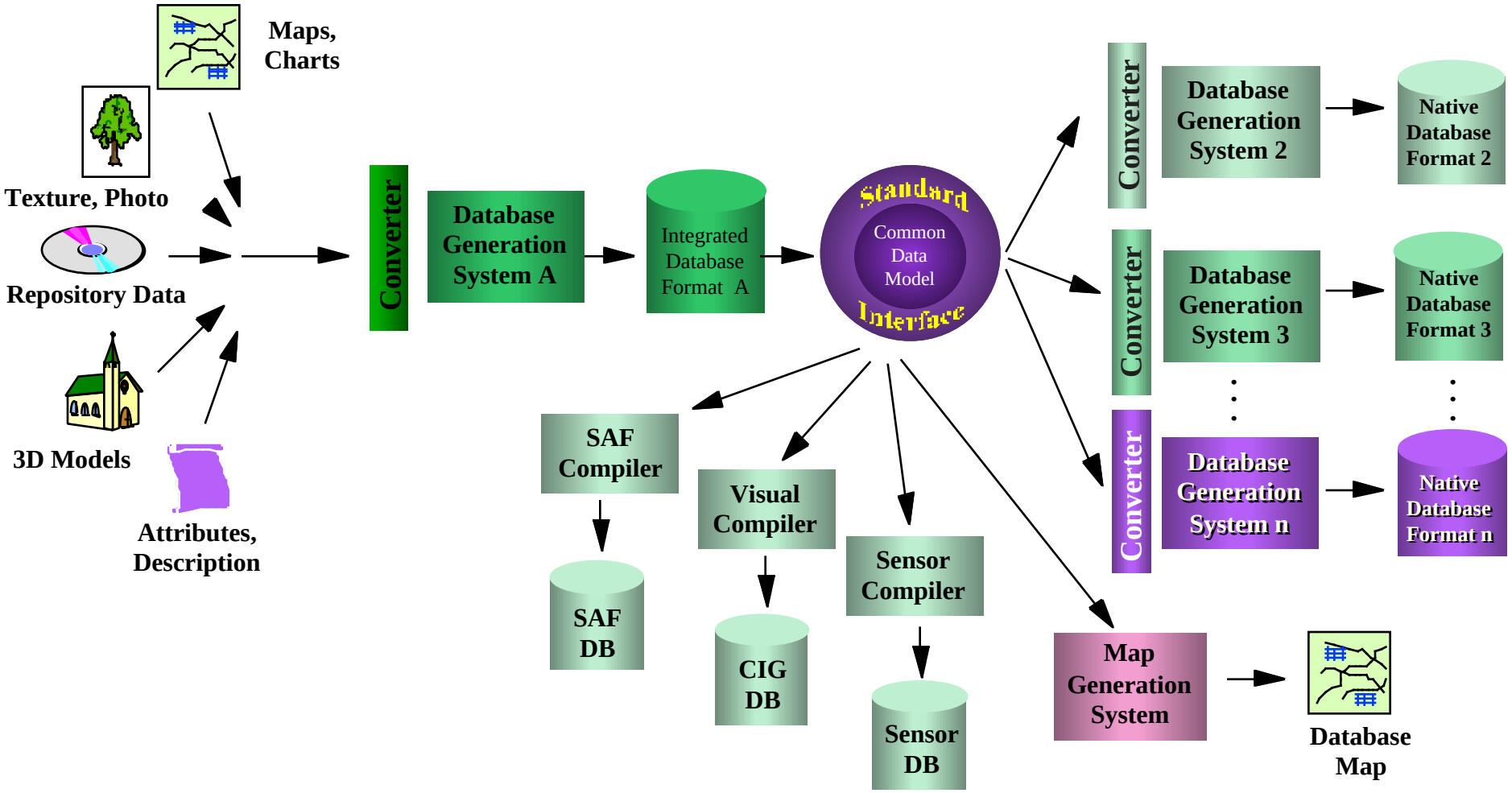

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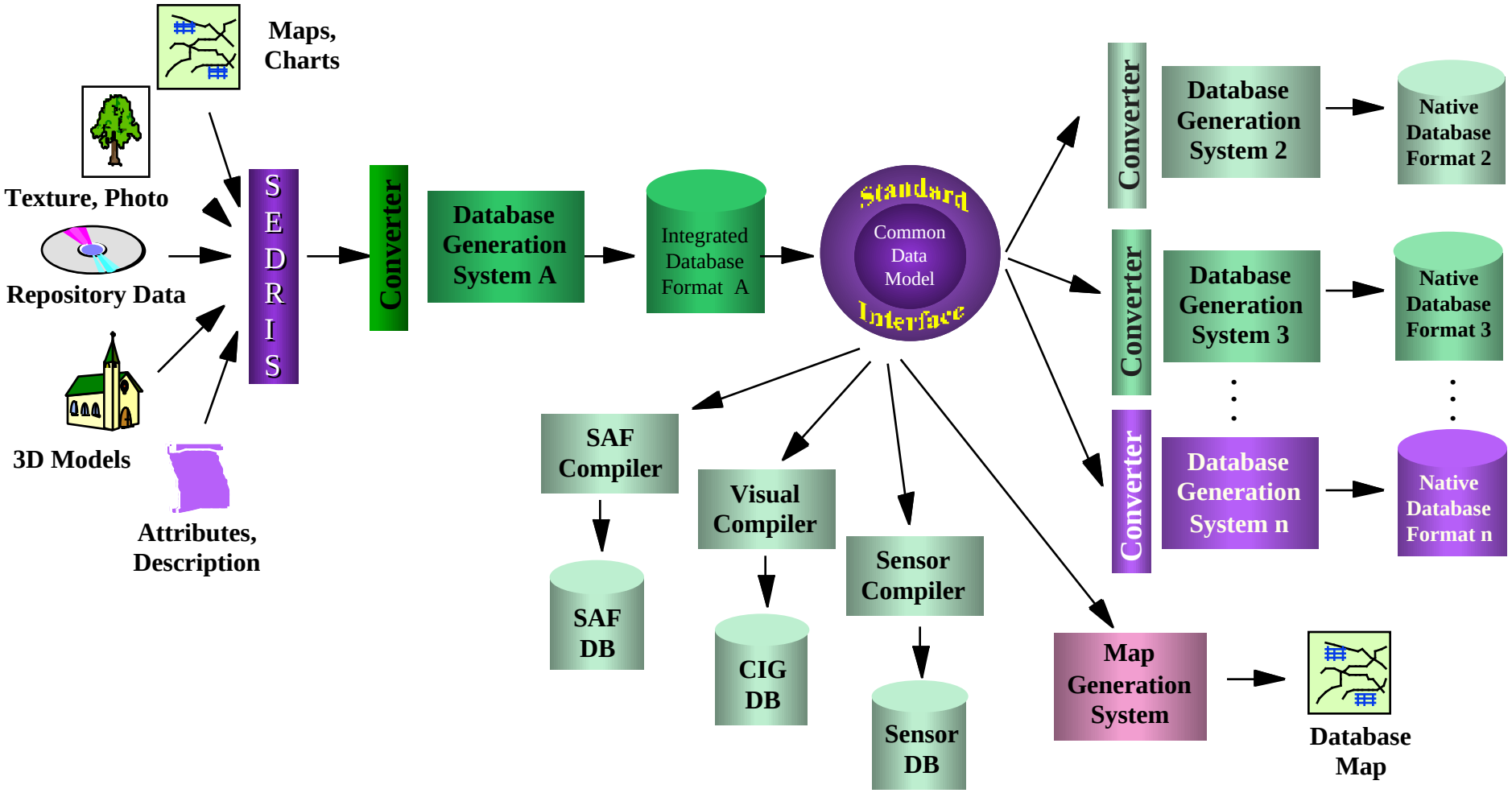
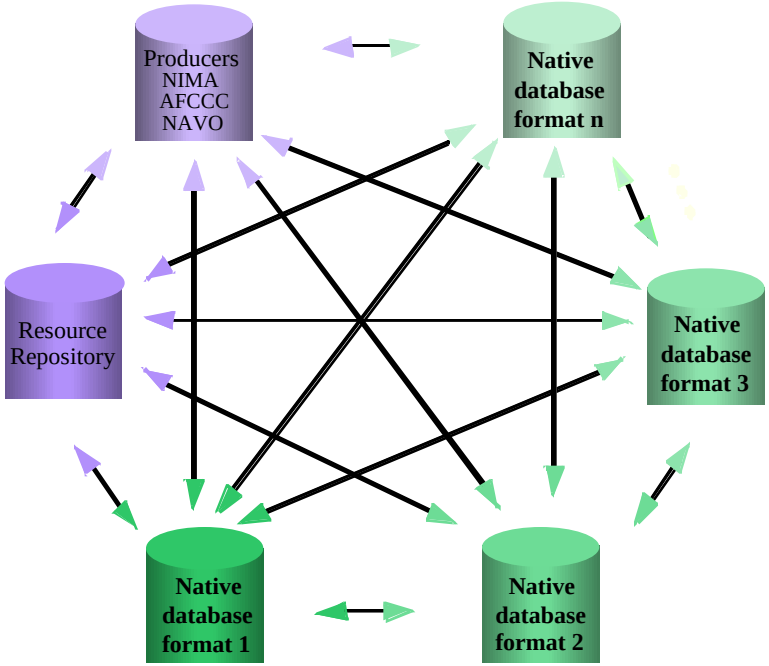
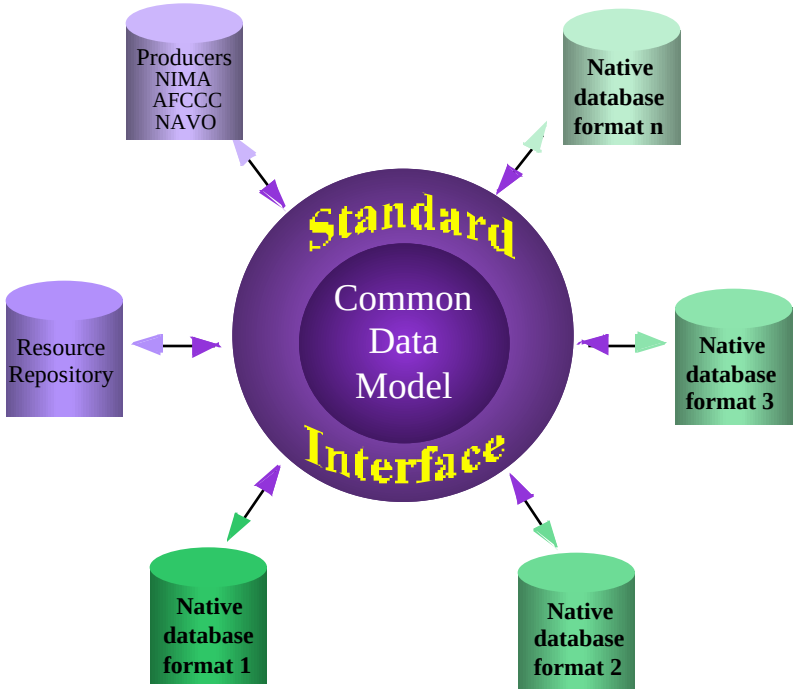


Access to Resources

Synthetic Environment Data Representation and Interchange Specification Program





STATUS QUO

- No Standard Data Representation Model
- Limited Support to Heterogeneous Simulation
- Indeterminant Interchange Mechanism
- Expensive Database Conversion

SEDRIS ADVANTAGES

- Complete Representation
- Enables Interoperability
- Lossless & Consistent Interchange
- 100X Reduction in Conversion Costs

Data Modeling **API Prototyping** **Format Prototyping** **SEDRIS FORMAT**

CY 1995 ---------- 1996 ---------- 1997 ---------- 1998---------- 1999

SEDRIS Objectives

- To articulate and capture in one place the complete set of data elements and associated relationships needed to fully represent the environment.

- To support the full range of simulation applications, (e.g., Computer Generated Forces, all environmental domains, manned and visual systems, and sensor systems).

- To provide a standard data interchange mechanism and format which is as complete and lossless as possible to support the pre-distribution of synthetic environmental data and promote the sharing of databases among heterogeneous simulations.

SEDRIS Benefits

- **Significant reduction in database reuse cost:**
  - **Current creation costs ~ $1Ms**
  - **Current conversion costs ~ $100Ks**
  - **SEDRIS should reduce the conversion cost to ~$1Ks**
- **Ability to access and exchange environmental databases in a robust fashion to enable interoperability**
- **A data model that allows for complete representations**
- **Consistent, coherent, and simple data access interface**
- **Expected interchange mechanism for all DoD M&S Programs**

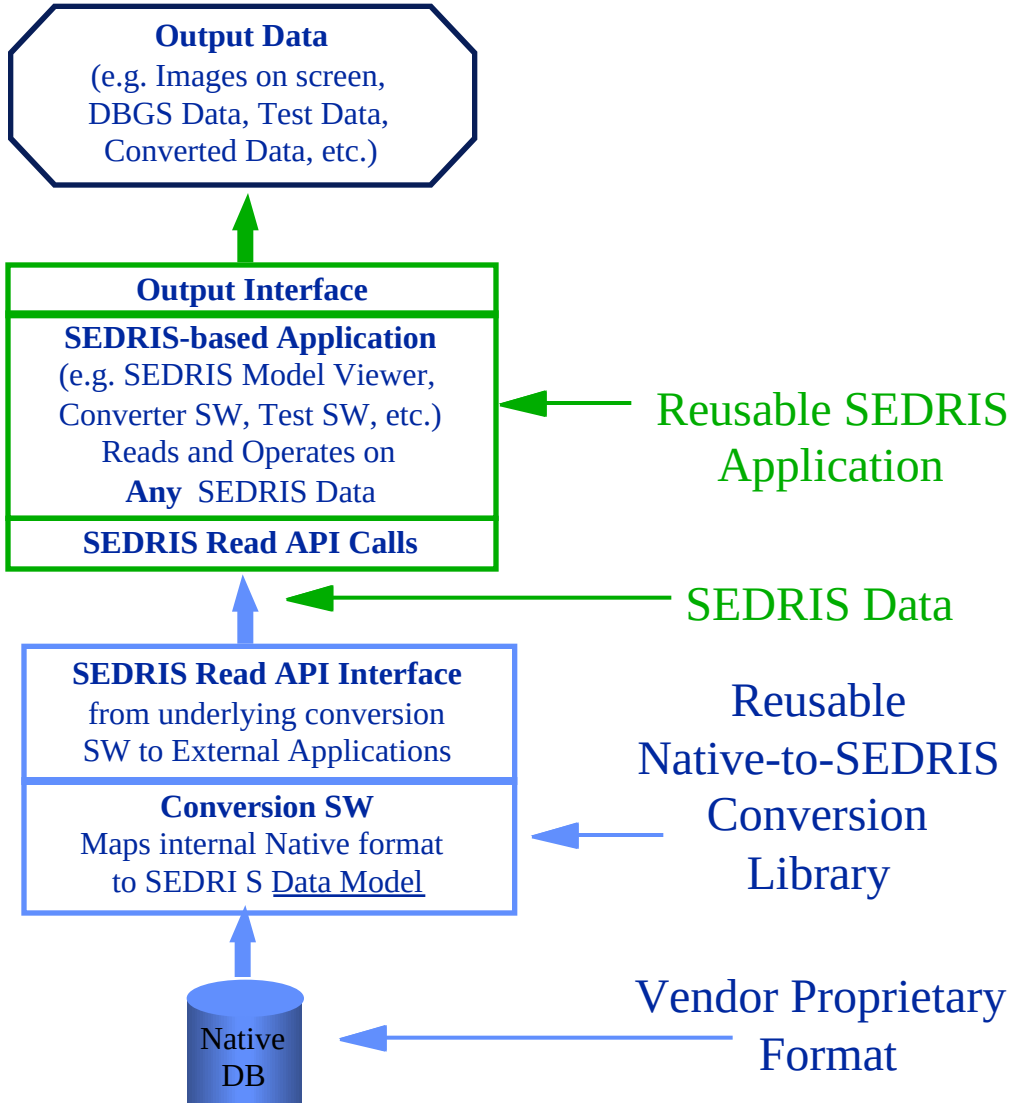
SEDRIS Development Status

- Data Model baselined using Rumbaugh and IDEF1X notations
  - Version 1.0 of Data Model and API released Jun 1996
  - Available via WWW (http://www.sedris.net)
- Developed several SEDRIS-based Applications
  - Database viewer (side-by-side)
  - Database browser
- Extracting 3D models, terrain, and features from a variety of formats through SEDRIS API today
  - S1000 environmental databases
  - Evans and Sutherland 3D models
  - Vector Product Format (VPF) databases

SEDRIS Prototype Plan

Key Objectives:

- **Verify the SEDRIS data model**
- **Implement prototype access to various types and formats of environmental data**
- **Continuously revise and improve SEDRIS**



Accomplishments

- **Data Model is stable and available via WWW**
  - **Baselined SEDRIS 1.0 in June 1996**
  - **Extracting 3D models, textures, terrain, and features *now***
- **Prototyping effort is well underway**
  - **9 ongoing contracts**

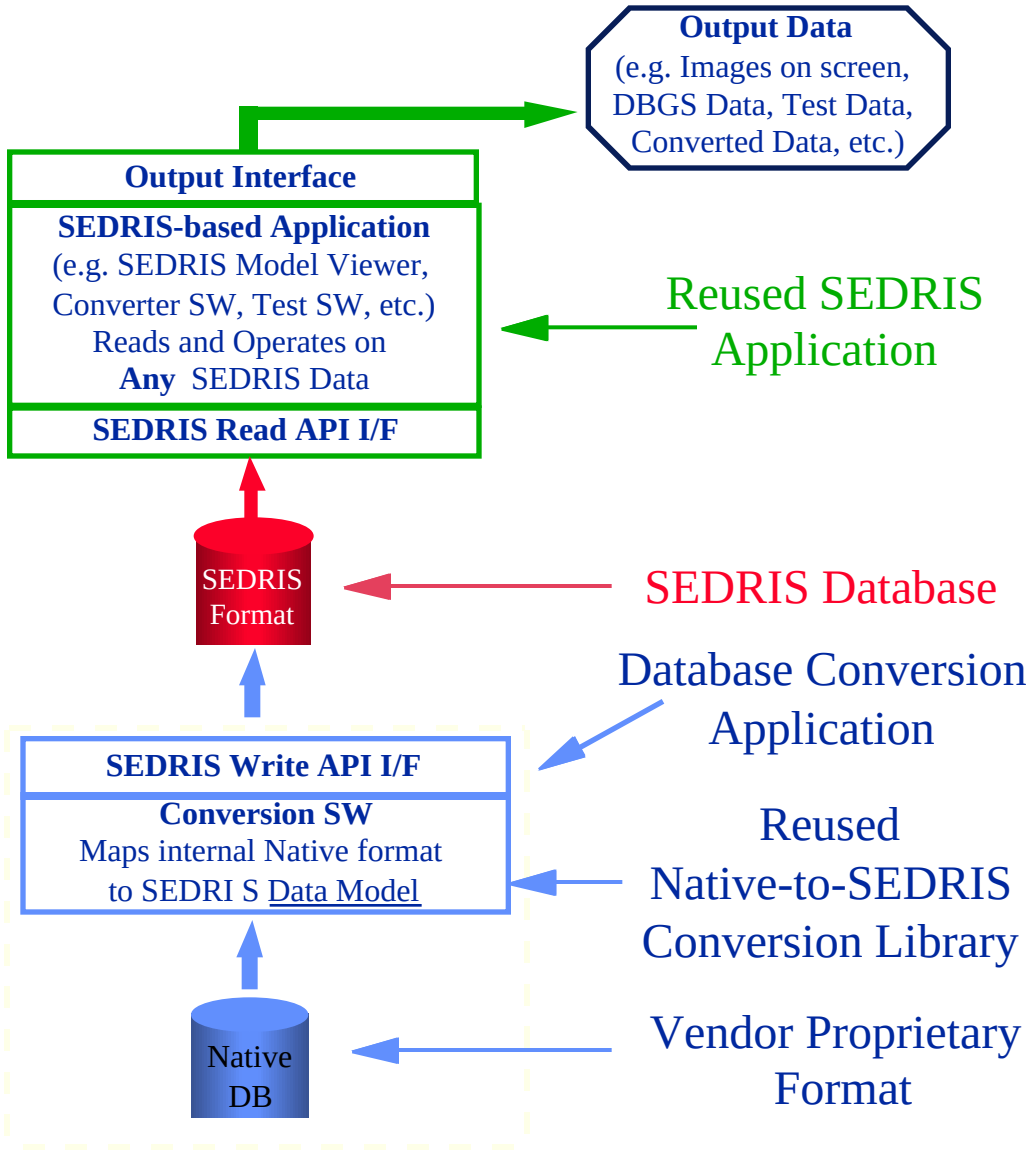
PAR Government Systems	**SEDRIS - Vector Product Format**
Evans and Sutherland	**CCTT Databases**
Coryphaeus Software Inc.	**Designer Workbench, EasyT**
Lockheed Martin Information Systems	**TARGET Databases**
Lockheed Martin Tactical Defense Systems	**SOF-Aircrew Trainer System**
Environmental Systems Research Institute	**VPF as a SEDRIS format**
Analysis and Technology	**Oceanographic Acoustics Data**
TASC	**Atmospheric / Oceanographic Data**
SAIC	**Semi-Automated Forces Databases**

- **Standardization efforts have begun**
  - **Initial IDEF1X Data Model developed**
  - **Product of the Natural Environment Forum of the Simulation Interoperability Workshop**

Final SEDRIS Configuration

Key Objectives:

- **Determine appropriate format for SEDRIS interchange**
- **Implement prototype format and WRITE API libraries**
- **Continuously revise and improve SEDRIS**



SEDRIS Demo

- **SEDRIS Viewer application extracts:**
  - **SIMNET and STOW 97 3D Models and Textures**
    - **S1000 format (Government owned)**
  - **CCTT 3D Models and Textures**
    - **Proprietary format (Evans and Sutherland)**
- **SEDRIS Object Browser provides:**
  - **Graphical display of all database elements**
  - **Access to all data through Read Level 0 API**
- **Key Points**
  - **Common SEDRIS API and Viewer application was used to extract from very different databases**
  - **SEDRIS is powerful tool and investment in software is reusable**

Summary

- **SEDRIS is a . . .**
  - **Representational Data Model of the synthetic environment**
  - **Powerful Application Program Interface (API) for interchanging synthetic environment data**
- **Key features:**
  - **Complete and unambiguous description**
  - **Lossless interchange**
  - **Standard interface**
  - **Reusable applications**